

WE CLAIM:

1. An RF power delivery system for plasma processing comprising:
  - a) an RF power generator disposed to deliver power to a plasma chamber for creating a plasma to deposit thin films on a substrate;
  - b) an impedance matching network connected to the output of the RF power generator to provide an efficient transfer of power from the RF power generator to the plasma in the chamber by matching the impedance of the plasma to the operating impedance of the generator; and
  - c) a secondary reactive termination circuit connected between the output of the RF power generator and the input of the plasma chamber to allow the tight regulation or limiting of the voltage and current components of the secondary frequencies within the process plasma
- 15 2. An RF power delivery system for plasma processing comprising as recited in claim 1 wherein the secondary reactive termination circuit is comprised a parallel connection of a first and second capacitor connected in parallel series connected to an inductor and a variable capacitor.
- 20 3. An RF power delivery system for plasma processing comprising as recited in claim 2 wherein the secondary reactive circuit controls the impedance of the match network designed primarily to operate at the fundamental frequency of the RF power generator as seen by secondary frequencies in the system.
- 25 4. An RF power delivery system for plasma processing comprising as recited in claim 3 wherein a variable capacitor that allows tight regulation of the voltage, current, and power within a process at discrete frequencies without concern for impedance variability induced by other components in the system.